

FORM PTO-1390 U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		ATTORNEY'S DOCKET NO.  <b>PHN 17,662</b>										
TRANSMITTAL LETTER TO THE UNITED STATES DESIGNED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371		U.S. Application No. <b>09/1856768</b> (See 37 C.F.R. 1.5)										
INTERNATIONAL APPLICATION NO. <b>PCT/EP0009483</b>	INTERNATIONAL FILING DATE <b>September 26, 2000</b>	PRIORITY DATE CLAIMED <b>OCTOBER 1, 1999</b>										
TITLE OF INVENTION <b>ELECTRIC LAMP</b>												
APPLICANT(S) FOR DO/EO/US <b>MAARTEN WALTER STEINMAN, MATHIAS LEONARDUS MARIA TUNISSEN</b>												
Applicant(s) herewith submit to the United States Designated/Elected Office (DO/EO/US) the following items and other information:												
1. <input checked="" type="checkbox"/> This is a <b>FIRST</b> submission of items concerning a filing under 35 U.S.C. 371. 2. <input type="checkbox"/> This is a <b>SECOND</b> or <b>SUBSEQUENT</b> submission of items concerning a filing under 35 U.S.C. 371. 3. <input checked="" type="checkbox"/> This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1). 4. <input type="checkbox"/> A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date. 5. <input checked="" type="checkbox"/> A copy of the International Application as filed (35 U.S.C. 371 (c)(2)) a. <input checked="" type="checkbox"/> is transmitted herewith (required only if not transmitted by the International Bureau). b. <input type="checkbox"/> has been transmitted by the International Bureau. c. <input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US). 6. <input type="checkbox"/> A translation of the International Application into English (35 U.S.C. 371(c)(2)) 7. <input checked="" type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3)) a. <input type="checkbox"/> are transmitted herewith (required only if not transmitted by the International Bureau). b. <input type="checkbox"/> have been transmitted by the International Bureau. c. <input type="checkbox"/> have not been made; however, the time limit for making such amendments has <b>NOT</b> expired. d. <input checked="" type="checkbox"/> have not been made and will not be made. 8. <input type="checkbox"/> A translation of the amendment to the claims under PCT Article 19 (35 U.S.C. 371 (c)(3)). 9. <input checked="" type="checkbox"/> An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)). 10. <input type="checkbox"/> A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)). Items 11. to 15. below concern document(s) or information included: 11. <input type="checkbox"/> An Information Disclosure Statement under 37 C.F.R. 1.97 and 1.98. 12. <input checked="" type="checkbox"/> An assignment document for recording. A separate cover sheet is compliance with 37 C.F.R. 3.28 and 3.31 is included. 13. <input type="checkbox"/> A FIRST preliminary amendment. <input type="checkbox"/> A SECOND OR SUBSEQUENT preliminary amendment. 14. <input type="checkbox"/> A substitute specification. 15. <input type="checkbox"/> A change of power of attorney and/or address letter. 16. <input checked="" type="checkbox"/> Other items or information: <b>Application as published (WO01/26129)</b> <b>1 Sheet of Formal Drawing</b>												
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="2" style="text-align: center; padding: 5px;"> <b>CERTIFICATE OF EXPRESS MAILING</b> </td> </tr> <tr> <td style="padding: 5px;">           Express Mail Mailing Label No. <b>E2686948918</b> </td> <td style="padding: 5px;">           Date of Deposit <b>MAY 24, 2001</b> </td> </tr> <tr> <td colspan="2" style="padding: 5px;">           I hereby certify that this paper and/or fee is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 C.F.R. 1.10 on the date indicated above and is addressed to the:         </td> </tr> <tr> <td colspan="2" style="padding: 5px;"> <div style="display: flex; justify-content: space-between;"> <div>               Commissioner for Patents                Washington, D.C. 20311             </div> <div style="text-align: right;"> <i>Noemi Chapa</i>                Signature             </div> </div> </td> </tr> <tr> <td colspan="2" style="padding: 5px;"> <div style="display: flex; justify-content: space-between;"> <div>               Noemi Chapa                Typed Name             </div> <div></div> </div> </td> </tr> </table>			<b>CERTIFICATE OF EXPRESS MAILING</b>		Express Mail Mailing Label No. <b>E2686948918</b>	Date of Deposit <b>MAY 24, 2001</b>	I hereby certify that this paper and/or fee is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 C.F.R. 1.10 on the date indicated above and is addressed to the:		<div style="display: flex; justify-content: space-between;"> <div>               Commissioner for Patents                Washington, D.C. 20311             </div> <div style="text-align: right;"> <i>Noemi Chapa</i>                Signature             </div> </div>		<div style="display: flex; justify-content: space-between;"> <div>               Noemi Chapa                Typed Name             </div> <div></div> </div>	
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U.S. APPLICATION NO. (If known, see 37 C.F.R. 1.5)		INTERNATIONAL APPLICATION NO.		ATTORNEY'S DOCKET NUMBER	
09/856768		PCT/EP00/09483		PHN 17,662	
17 [ ] The following fees are submitted: <b>BASIC NATIONAL FEE (37 C.F.R. 1.492(A)(1)-(5)):</b> Search Report has been prepared by the EPO or JPO \$940.00 International preliminary examination fee paid to USPTO (37 C.F.R. 1.482) \$720.00 No international preliminary examination fee paid to USPTO (37 C.F.R. 1.482) but international search fee paid to USPTO (37 C.F.R. 1.445(a)(2)) \$760.00 Neither international preliminary examination fee (37 C.F.R. 1.482) nor international search fee (37 C.F.R. 1.445(a)(2)) paid to USPTO \$970.00 International preliminary examination fee paid to USPTO (37 C.F.R. 1.482) and all claims satisfied provisions of PCT Article 33(2)-(4) \$ 96.00 ENTER APPROPRIATE BASIC FEE AMOUNT = \$870.00				CALCULATIONS (PTO USE ONLY)	
Surcharge of \$130.00 for furnishing the oath or declaration later than [ ] 20 [ ] 30 months from the earliest claimed priority date (37 C.F.R. 1.492(e)).				\$	
CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		
Total Claims	2 - 20 =		X \$ 18.00	\$	
Independent claims	1 - 3 =		X \$ 78.00	\$	
MULTIPLE DEPENDENT CLAIMS (if applicable)			+ \$260.00	\$	
TOTAL OF ABOVE CALCULATIONS =				\$870.00	
Reductions by 1/2 for filing by small entity, if applicable. Verified Small Entity Statement must also be filed (Note 37 C.F.R. 1.9, 1.27, 1.28)				\$	
SUBTOTAL =				\$870.00	
Processing fee of \$130.00 for furnishing the English translation later than [ ] 20 [ ] 30 months from the earliest claimed priority date (37 C.F.R. 1.492(f)).				\$	
TOTAL NATIONAL FEE =				\$	
Fee for recording the enclosed assignment (37 C.F.R. 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 C.F.R. 3.28.3.31). \$40.00 per property				\$40.00	
TOTAL FEES ENCLOSED =				\$1,010.00	
				Amount to be refunded	\$
				charged	\$
a. [ ] A check in the amount \$_____ to cover the above fees is enclosed. b. [X] Please charge my Deposit Account No. <u>14-1279</u> in the amount of <u>\$1,010.00</u> to cover the above fees. A duplicate copy of this sheet is enclosed. c. [X] The Commissioner is hereby authorized to charge any additional fee, with the exception of the Base Issue Fee, which may be required, or credit any overpayment to Deposit Account No. <u>14-1279</u> . A duplicate copy of this sheet is enclosed.					
NOTE: Where an appropriate time limit under 37 C.F.R. 1.494 or 1.495 has not been met, a petition to revive (37 C.F.R. 1.137(a) or (b)) must be filed and granted to restore the application to pending status.					
SEND ALL CORRESPONDENCE TO: Corporate Patent Counsel Phillips Electronics North America Corporation Tarrytown, NY 10591					
DATE OF MAILING:					
(SIGNATURE) Michael E. Marion 32,266 (REGISTRATION NUMBER)					

09/856768

30.03.2000

531 Rec'd PC

24 MAY 2001

Electric lamp.

The invention relates to an electric lamp comprising  
a glass lamp vessel which is closed in a gastight manner and in which an  
electric element is accommodated,  
current conductors connected to the electric element which each have an end  
5 portion of molybdenum projecting to outside the lamp vessel, said end portion being provided  
with means for protection against oxidation.

Such an electric lamp is known from EP 573 114.

Current conductors with molybdenum end portions are often used in electric  
lamps because this metal is resistant to high temperatures and because this metal has a  
coefficient of expansion which matches that of hard glasses well and deviates only little from  
that of quartz glass, i.e. glass with an  $\text{SiO}_2$  content of at least 95% by weight.

It is a disadvantage of molybdenum, however, that it readily oxidates at room  
temperature already, so that there is a considerable risk that a good electrical contact with, for  
example, the connection terminals of a lampholder will be lost.

According to the cited patent document, the end portions are provided with a  
molybdenum nitride coating. A disadvantage of the known lamp is, however, that an oxidation  
resistance up to no more than a comparatively low temperature, i.e. approximately 200 °C, is  
20 obtained. Furthermore, the coating has the additional disadvantage that the end portions  
become more liable to fracture.

It is an object of the invention to provide an electric lamp of the kind described  
25 in the opening paragraph in which the above disadvantages are counteracted.

According to the invention, this object is achieved in that the electric lamp of  
the kind described in the opening paragraph is characterized in that the end portion has a skin  
which is chosen from a group of materials formed by titanium nitride and chromium carbide.

The titanium nitride or chromium carbide skin is not only easy to realize, but it is also an effective agent against oxidation not only at room temperature but also at elevated temperatures, for example up to approximately 400 °C. Titanium nitride and chromium carbide, moreover, have the advantages that they do not lead to an increased brittleness of the molybdenum end portion and that they are thermally stable also at very high temperatures, for example 2000 °C. That is to say that titanium nitride and chromium carbide substantially do not form compounds or alloys with molybdenum which melt at lower temperatures than those used in the manufacture of the lamp. The thermal stability at very high temperatures also implies that no dissociation of the compounds occurs owing to the high temperature, leading to compounds which are unsuitable for the oxidation-resistant coating. This renders said compounds suitable for use as a skin on metal parts which is effective against oxidation, for example in lamps, for example quartz glass lamps, for which very high temperatures are used in the lamp manufacturing process.

Preferably, the skin has a layer thickness of at least 2 µm and at most 3 µm. A layer thickness below 2 µm provides the molybdenum with an insufficient protection against oxidation. A layer thickness above 3 µm is unnecessarily expensive because it does not provide any better protection against oxidation than a skin with a layer thickness of 3 µm.

The oxidation-resistant skin on the molybdenum end portion may be readily obtained in a vapor deposition process, for example a CVD process. The CVD process has the advantage that many molybdenum end portions can be vaporized simultaneously in one and the same process. A molybdenum end portion provided with an oxidation-resistant skin can thus be manufactured comparatively inexpensively.

In spite of the protection against oxidation provided by the titanium nitride or chromium carbide skin, the protected end portion can be processed in a conventional manner, for example by welding to a metal foil, for example to a molybdenum foil on which a gastight seal of the lamp vessel is realized. A good electrical connection, which is only a few mΩ larger than in the case of platinum or platinum-plated end portions, can be realized on the protected end portion, for example by means of contacts of a lampholder.

The electric element of the lamp may be a pair of electrodes in an ionizable gas or an incandescent body, for example in an inert gas comprising halogen. The lamp vessel may have one or several seals from which a current conductor issues to the exterior. The lamp vessel, for example made of quartz glass or hard glass, may be joined together with a reflector body so as to form a lamp.

An embodiment of the electric lamp according to the invention is shown in longitudinal sectional view in the drawing.

In the figure, the electric lamp 1 has a glass lamp vessel 2 which is closed in a gastight manner and in which an electric element 3, an incandescent body in the Figure, is accommodated, and a reflector body 10 which has a mirroring surface 11 and a closing plate 13. The lamp vessel 2 is secured in the reflector body 10 by means of cement 12. Current conductors 4 having molybdenum end portions 5 projecting to outside the lamp vessel 2 are connected to the electric element 3. The end portion 5 has means for protection against oxidation. The end portion 5 for this purpose has a skin of chromium carbide. The skin has a layer thickness of approximately 2.5  $\mu\text{m}$ .

In the Figure, the current conductors 4 comprise legs of the incandescent body 3 and molybdenum foils connected thereto by means of welds. End portions 5 provided with chromium carbide skins are also welded to the foils and serve as contact pins for the lamp.

Experiments with this lamp 1, which has a rated power of 100 W and a lamp voltage of 12 V, have demonstrated that the lamp 1 has a useful life which is twice that of a known lamp, and a useful life equal to that of a lamp having end portions 5 provided with a platinum coating.

The lamp shown may be used, for example, for accent lighting, for projection purposes, or for photo, video, or film recording sessions.

## CLAIMS:

1. An electric lamp comprising  
a glass lamp vessel (2) which is closed in a gastight manner and in which an  
electric element (3) is accommodated,  
current conductors (4) connected to the electric element which each have an end  
5 portion (5) of molybdenum projecting to outside the lamp vessel, said end portion being  
provided with means for protection against oxidation,  
characterized in that the end portion (5) has a skin which is chosen from a group  
of materials formed by titanium nitride and chromium carbide.
2. An electric lamp as claimed in claim 1, characterized in that the skin has a layer  
thickness of at least 2  $\mu\text{m}$  and at most 3  $\mu\text{m}$ .

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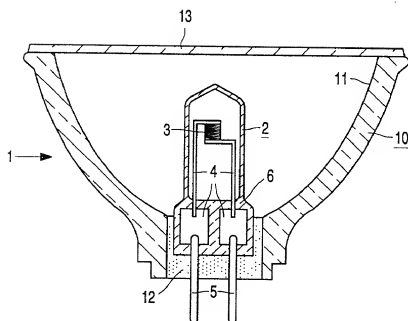
**ABSTRACT:**

The electric lamp (1) has a lamp vessel (2), wherein an electric element (3) is accommodated. Said element is connected to current conductors (4), molybdenum end portions (5) of which extend outside the lamp vessel and have a skin of titanium nitride or chromium carbide as a protection against oxidation.

5

Fig. 1

1/1





IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

- In re Application of

Atty. Docket

MAARTEN W. STEINMAN ET AL

PHN 17,662

Filed: CONCURRENTLY

Title: ELECTRIC LAMP

Commissioner for Patents, Washington, D.C. 20231

APPOINTMENT OF ASSOCIATES

Sir:

The undersigned Attorney of Record hereby revokes all prior appointments (if any) of Associate Attorney(s) or Agent(s) in the above-captioned case and appoints:

**ERNESTINE C. BARTLETT**

(Registration No. 22,861)

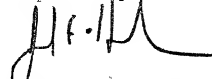
**MICHAEL E. MARION**

(REGISTRATION NO. 32,266)

c/o U.S. PHILIPS CORPORATION, Intellectual Property Department, 580 White Plains Road, Tarrytown, New York 10591, his Associate Attorney(s)/Agent(s) with all the usual powers to prosecute the above-identified application and any division or continuation thereof, to make alterations and amendments therein, and to transact all business in the Patent and Trademark Office connected therewith.

ALL CORRESPONDENCE CONCERNING THIS APPLICATION AND THE LETTERS PATENT WHEN GRANTED SHOULD BE ADDRESSED TO THE UNDERSIGNED ATTORNEY OF RECORD.

Respectfully,



Jack E. Haken, Reg. 26,902  
Attorney of Record

Dated at Tarrytown, New York  
on May 24, 2001.

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled: **"Electric lamp"**  
the specification of which (check only one item below):

☐ is attached hereto.

☐ was filed as United States application

Serial No

on

and was amended

on

☒ was filed as PCT international application

Number PCT/EP00/09483

on 26 September 2000

and was amended under PCT Article 19

on \_\_\_\_\_ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, § 1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, § 119 of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed:

PRIOR FOREIGN/PCT APPLICATION(S) AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. 119:

COUNTRY	APPLICATION NUMBER	DATE OF FILING DAY, MONTH, YEAR	PRIORITY CLAIMED UNDER 35 USC 119
Europe	99203224.3	01 October 1999	YES

Combined Declaration For Patent Application and Power of Attorney (Continued) (includes Reference to PCT International Applications)		Attorneys Docket Number <b>PHN 17.662 US</b>
POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. (List name and registration number)		
Jack E. Haken, Reg. No. 26,902 Michael E. Marion, Reg. No. 32, 66 Edward M. Blocker, Reg. No. 30,245		Direct Telephone Calls to: (name and telephone number) (914)332-0222

201	FULL NAME OF INVENTOR	FAMILY NAME	FIRST GIVEN NAME	SECOND GIVEN NAME
	RESIDENCE & CITIZENSHIP	CITY	STATE OR FOREIGN COUNTRY	COUNTRY OF CITIZENSHIP
	POST OFFICE ADDRESS	POST OFFICE ADDRESS	CITY	STATE & ZIP CODE/COUNTRY
202	FULL NAME OF INVENTOR	FAMILY NAME	FIRST GIVEN NAME	SECOND GIVEN NAME
	RESIDENCE & CITIZENSHIP	CITY	STATE OR FOREIGN COUNTRY	COUNTRY OF CITIZENSHIP
	POST OFFICE ADDRESS	POST OFFICE ADDRESS	CITY	STATE & ZIP CODE/COUNTRY
203	FULL NAME OF INVENTOR	FAMILY NAME	FIRST GIVEN NAME	SECOND GIVEN NAME
	RESIDENCE & CITIZENSHIP	CITY	STATE OR FOREIGN COUNTRY	COUNTRY OF CITIZENSHIP
	POST OFFICE ADDRESS	POST OFFICE ADDRESS	CITY	STATE & ZIP CODE/COUNTRY
204	FULL NAME OF INVENTOR	FAMILY NAME	FIRST GIVEN NAME	SECOND GIVEN NAME
	RESIDENCE & CITIZENSHIP	CITY	STATE OR FOREIGN COUNTRY	COUNTRY OF CITIZENSHIP
	POST OFFICE ADDRESS	POST OFFICE ADDRESS	CITY	STATE & ZIP CODE/COUNTRY
205	FULL NAME OF INVENTOR	FAMILY NAME	FIRST GIVEN NAME	SECOND GIVEN NAME
	RESIDENCE & CITIZENSHIP	CITY	STATE OR FOREIGN COUNTRY	COUNTRY OF CITIZENSHIP
	POST OFFICE ADDRESS	POST OFFICE ADDRESS	CITY	STATE & ZIP CODE/COUNTRY

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 if Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

SIGNATURE OF INVENTOR 201 CITY	SIGNATURE OF INVENTOR 202	SIGNATURE OF INVENTOR 203
DATE 26 April 2001	DATE	DATE
SIGNATURE OF INVENTOR 204	SIGNATURE OF INVENTOR 205	
DATE	DATE	

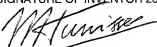
U.S. DEPARTMENT OF COMMERCE- Patent and Trademarks Office

(July 1994)

<b>Combined Declaration For Patent Application and Power of Attorney (Continued)</b> <small>(Includes Reference to PCT International Applications)</small>		Attorneys Docket Number <b>PHN 17.662 US</b>
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Jack E. Haken, Reg. No. 26,902 Michael E. Marion, Reg. No. 32, 66 Edward M. Blocker, Reg. No. 30,245		Direct Telephone Calls to: (name and telephone number) (914)332-0222

	FULL NAME OF INVENTOR	FAMILY NAME	FIRST GIVEN NAME	SECOND GIVEN NAME
201	RESIDENCE & CITIZENSHIP	<b>STEINMAN</b>	<b>Maarten</b>	<b>Walter</b>
	CITY	<b>Eindhoven</b>	STATE OR FOREIGN COUNTRY <b>The Netherlands</b>	COUNTRY OF CITIZENSHIP <b>The Netherlands</b>
	POST OFFICE ADDRESS	<b>Prof. Holstlaan 6</b>	CITY <b>5656 AA Eindhoven</b>	STATE & ZIP CODE/COUNTRY <b>The Netherlands</b>
202	FULL NAME OF INVENTOR	<b>TUNISSEN</b>	<b>Mathias</b>	<b>Leonardus Maria</b>
	RESIDENCE & CITIZENSHIP	<b>Nederweert NLX</b>	STATE OR FOREIGN COUNTRY <b>The Netherlands</b>	COUNTRY OF CITIZENSHIP <b>The Netherlands</b>
	POST OFFICE ADDRESS	<b>Post Office Address Eikenstraat 26</b>	CITY <b>6031 VV Nederweert</b>	STATE & ZIP CODE/COUNTRY <b>The Netherlands</b>
203	FULL NAME OF INVENTOR	FAMILY NAME	FIRST GIVEN NAME	SECOND GIVEN NAME
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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 if Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

SIGNATURE OF INVENTOR 201 CITY	SIGNATURE OF INVENTOR 202 	SIGNATURE OF INVENTOR 203
DATE	DATE 26 April 2001	DATE
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DATE	DATE	

U.S. DEPARTMENT OF COMMERCE - Patent and Trademarks Office

(July 1994)